

PSYCHE.

A COMPARISON OF COLIAS HECLA WITH C. MEADII AND C. ELIS.

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THE MALES.

As the males of *Meadii* and *Elis* are but narrowly separate, I have made a series of measurements from which to derive numerical averages in the two species, as to total expanse of the front pair of wings, as to breadth of dark border of primary at middle of outer margin, and particularly as to the proportion between this breadth of dark border and the expanse of the corresponding wing. These tests were also applied to *Hecla*, although there scarcely of equal significance on account of the small number of examples at my command. Mr. David Bruce very kindly sent me a large series of *Meadii* for examination, so that I have been enabled to compare 42 ♂, 23 ♀ *Meadii* with 7 ♂, 5 ♀ *Hecla* and 56 ♂, 75 ♀ *Elis*. The males were individually measured, and the data reduced to general averages, with following results.

Average total expanse (sum of the length of the two primaries plus breadth of body): *Meadii*, nearly 47 mm.; *Hecla*, nearly 45 mm.; *Elis*, nearly 50 mm.

Average breadth of dark border of primary, at middle of outer margin: *Meadii*, $4\frac{1}{4}$ mm.; *Hecla*, $2\frac{5}{7}$ mm.; *Elis*, $3\frac{3}{7}$ mm.

Proportion between average breadth of dark border of primary and average length of primary (measured from apex to center of base of wing): in *Meadii* the breadth of dark border proved to be slightly over $19\frac{1}{3}$ per cent of length of primary, in *Hecla* 13 per cent, in *Elis* slightly over 14 per cent.

These are significant averages. The individual measurements from which they were obtained show that in regard to expanse of wing, as in other respects, *Meadii* is in considerable degree less subject to variation than *Elis*. *Meadii*, in its extreme terms of expanse, only varies to 4 mm. below its average figure and to 3 mm. above its average. *Elis* ranges to 10 mm. below and to 6 mm. above its own average term. The extremes in *Meadii* are only 7 mm. apart, but in *Hecla* they are 10 mm. apart, and *Elis* has a range of 16 mm. of variation in this dimension, or 11 mm. if one extremely abnormal example be omitted from the comparison. The uniformity of expanse in

Meadii is remarkable. Omitting two examples, the largest (50 mm.) and the smallest (43 mm.), the remaining forty show a variation in expanse of only 4 mm., from 45 to 49 mm. In *Elis*, leaving out the lowest term (one specimen of 40 mm.) and the highest term (two of 56 mm.), the pendulum of variation still swings between 45 and 54 mm., a range more than double that of *Meadii*. *Hecla*, also, is evidently far more variable in expanse than *Meadii*, as shown even by this small series.

A comparison of the shape of dark border of fore-wing furnishes a valid distinction, parting *Hecla* from *Elis* and even more emphatically from *Meadii*, while it separates less decisively *Elis* from *Meadii*. In a very large majority of the *Meadii*, the dark border of fore-wing extends a considerable projection toward base of wing, both at internal angle and at apex. Owing to this salient projection the fore-wing is rendered extremely broad on costa. The curvature of inner edge of border, however, is so great that the costal excess of breadth is rapidly parted with in the backward course of the border. From a point of fore-wing nearly opposite the cell-spot, to a point a little back of posterior median nervule, the dark border of *Meadii* ♂ in a large majority of the specimens examined maintains closely an equal breadth. This is plainly the case in 39 of the 42. In the other 3 the border narrows very slightly from the front to the back of this median part; in one of

them on both fore wings, in the other two on right wing only. The rule then in *Meadii*, and a rule of almost universal application, is that the dark border of fore-wing is disproportionately broad on costa, loses this excess of breadth anterior to a point nearly opposite the discal spot, and throughout the median portion of the wing maintains closely an equal breadth. In a considerable proportion of individuals the border abruptly narrows more or less a little anterior to the submedian nerve, the disk color encroaching upon the marginal border in a broad irregular sinus whose deepest extension usually occurs at the submedian nerve.

The seven males of *Hecla* present a radically differing pattern of fore-wing border from that displayed by *Meadii*. The excess of breadth at costa, instead of being quickly dissipated in the backward progress of the border (as in *Meadii*), is parted with very gradually and evenly, so that *Hecla's* dark border becomes progressively narrower from costa to internal angle. This general method is plain in all the seven, though in two of them a part of the median extent of the border shows but a slight narrowing within itself. In all the seven a gradual reduction of breadth from costa to internal angle is a systematic detail, and it would effectively part them from all these *Meadii* males were there no other distinction. The differing shape of the fore-wing dark border is a far more decisive distinction between the two species than is the difference merely in breadth of border.

Hecla in these specimens differs from *Meadii* by exhibiting less tendency to extension of the dark border inward at costa and at internal angle: in *Meadii*, the color-pattern is salient and aggressive; in *Hecla*, stationary or retrograde.

The color on veins crossing dark border or primary seems to be a fluctuating and indecisive character. A tendency to show yellow scales on the veins of anterior part of border is somewhat prevalent in *Meadii*, while in *Hecla* more commonly than in *Meadii* the posterior part of wing also exhibits yellow veining on the border. The present material indicates that when the yellow veining occurs in *Hecla* it will generally be somewhat uniformly presented throughout the border, but in *Meadii* usually predominant toward apex.

The male of *Elis* approaches that of *Meadii* so closely that individuals of the former can be found which scarcely seem to differ tangibly from the latter: by a vague contrast in general appearance they part from *Meadii* and identify themselves with *Elis*. This somewhat elusive difference between closely similar individuals of contiguous species is difficult of analysis. Adjoining species are most readily discriminated as unities, by the opposition or unlikeness of the entire systems or combinations of pattern, containing in part closely similar or identical elements, and in part alien elements. A large series of each tends to manifest the entire amount of alienation separating each species from its nearest allies. Single

individuals are at best imperfectly representative; being themselves specialized fragments, they merely represent what the species would be if similarly specialized throughout. In estimating the relation between adjacent species adequate series should be examined. Safe conclusions cannot be drawn from comparison of isolated examples until the representative value of those examples has been ascertained. Individuals are typical or divergent: in the latter case, if divergent in the direction of the proximate species they express in relation to that species less than a typical amount of alienation; if divergent in a direction leading away from the proximate species, they exhibit relatively to it a degree of alienation (biological estrangement) which is greater than the typical contrast. From this it follows that individuals which have a more than typical degree of divergence from each other, representing adjacent species, will over-contrast those species, and on the other hand, unusually approximate examples in contiguous species will under-contrast the two species. In species so near of kin as *Elis* and *Meadii*, the most closely resemblant examples are exactly those which are least representative of the characters peculiar to their respective species, and most highly representative of characters common to the several closely allied species. *Elis* being greatly more variable than *Meadii*, the closest approximation between them is on the part of exceptional males of *Elis*. It may be said that *Meadii* as

a species is very close to certain exceptional males of *Elis*, and conversely that some *Elis* males are very near to the species *Meadii*. The approximation is on the part of occasional conservatively divergent *Elis* males. These divergent individuals of *Elis*, when isolated from their fellows and brought into comparison with *Meadii*, seem closer to the latter than they really are: the cause of this is, that the resemblance to *Meadii* is made conspicuous on account of the attention being attracted to it by the presence of examples of *Meadii*, the greater resemblance to the species *Elis* being overlooked by lack of a proper representation of *Elis* for comparison.

THE FEMALES.

In these three species the females compare very differently from the males. *Elis* and *Meadii*, which sometimes approach closely in the male, manifest in the female only a moderate general affinity, offset by a striking antagonism of pattern rarely found between such close allies in this genus. *Hecla* and *Meadii*, however, whose males differ widely, are parted in the female sex chiefly by fluctuating averages, so that their contrast in that sex is comparatively vague and informal, and in occasional individuals is found resemblance to the allied species in a degree which has sometimes proved confusing.

In the border of primary in *Meadii* the yellow spots are ordinarily irregular

in the extreme in size and outline; and they are sometimes hazy or nebulous, and extremely pallid, — two such examples are in this series. The variance between individuals as to degree of development of the yellow spots is great. There is a decided tendency to total eclipse of the spots, a tendency so influential that in seven specimens of this small lot the border is almost entirely solid black. This species exhibits great eccentricity in the presentation of the maculae, which are frequently of irregular shapes, often indeed peculiarly erratic in outline. It is the far rarer instances, with tolerably neat and comparatively even-sized spots, which closely resemble some *Hecla*; but such *Meadii* are not at all representative examples. The eccentricity of maculation spoken of is foreign to the method of *Elis*, and it is a peculiarity of which my small series of *Hecla* contains no suggestion. In the maculation of *Hecla*, as compared with that of *Meadii*, the spots are more equal in the same individual, and more uniform, taking one example with another.

In both *Meadii* and *Hecla* the yellow spots on dark border of primary are unequally developed, the mid-wing spot being often obsolete, and almost invariably at least feeble in development. This is the established method in both species.

Elis is remarkable for its symmetry of pattern, the maculation being in general conspicuously harmonic in the individual, and the middle spot having

approximate equality with the others. Examples of *Elis* in which the border spots of primary are not pretty uniform in size and shape, and those in which the mid-wing spot is not at least moderately well developed, are exceptional. The most informal in this series of *Elis* have the spots more neatly regular than in the most formal *Meadii* in the lot. Those *Meadii* with the spots largest are not nearer to *Elis* on that account, but rather show stronger contrast, as the diverse system of maculation in the two species is thereby rendered more obvious.

An occasional *Meadii*, having the spots on primary border more symmetrical than is usual, closely resembles some *Hecla*, so that in a large series of both a small percentage of the *Meadii* might prove difficult to part from a few of the *Hecla* by this test solely. In a large majority of cases, however, the two females differ widely in character of dark border of hind-wing: 18 out of 23 of these *Meadii* have a practically solid black hind-wing border, and 3 of these 5 *Hecla* have a most distinctly maculated border with the yellow spots large and conspicuous. *Meadii* with hind-wing border partly maculated, and *Hecla* with maculation of hind-wing border partly obscured, might not readily separate on this character alone. It follows then, that among the small number not distinguishable by characters of fore-wing border, one individual in many may also fall in the small proportion with hind-wing border of ambiguous char-

acter: that is to say, a percentage of a percentage occurs wherein the maculation of dark border of both primary and secondary is liable to prove too approximate or too obscure to rely upon in determining the position of the individual. Even these rare instances of close approximation should not defeat a student familiar with the two species. Other specialties of pattern are in some degree indicative, and it rarely indeed occurs that all significant distinctions lapse in a single individual. There remains also that indefinite but obvious fact known as "the general appearance," which furnishes an experienced observer with the most reliable and satisfactory guide in distinguishing one species from another.

In a general view of the three species, the most obvious fact is that *Hecla* male is distinct from the respective males of *Meadii* and *Elis*. Also, properly representative material makes conspicuously evident the divergence of the female of *Elis* from the females of *Hecla* and *Meadii*. The close approximation occurs between *Hecla* and *Meadii* in the female, between *Elis* and *Meadii* in the male. This complex of relationship is perhaps partly capable of explanation. *Hecla* may safely be considered the oldest of the three species, and *Elis* the youngest. In *Colias* the law of the agency of sex in race progress appears to be that the male is the conservative and the female the progressive sex. Accordingly, in the alliance under consideration, *Hecla* being the oldest

species, its male should be the most conservative element in the alliance; and *Elis* being the youngest species, its female should prove to be the most progressive element. *Hecla* male and *Elis* female occupy outposts as to race progress, and are thus of necessity more completely differentiated than the other elements of the alliance.

The comparison so far is from notes made several years ago. Having lately re-examined all descriptions and figures of *Hecla* available to me here in the wilderness, I am inclined to think my analysis of the figure-pattern accurate. In order to amplify my knowledge of *Hecla*, I applied to Dr. Strecker for details in regard to the *Hecla* males in his collection, making very specific enquiry as to shape of dark border of primary. In response three pen sketches were sent me, representing the range of variation observed in the Lapland and Greenland examples. These drawings show a method of border corresponding to that found in my own series and described in the present analysis. Another sketch represented the border of primary of *Meadii*, delineating precisely the style of dark border I have described as practically the constant fashion in that species.

In print, as also in correspondence, Mr. W. H. Edwards refers to the general ground color of some *Meadii* as indistinguishable from that of *Hecla*, or of some *Hecla*. and hales this resemblance into court as a witness to prove *Meadii* and *Hecla* one species. *Hecla*

was already well known when Mr. Edwards named *Meadii*, and if there is now no valid distinction between *Meadii* and *Hecla* there was none then, and in that case *Meadii* should not have been described. In Butterflies N. A., 1st series, Mr. Edwards closes thus his *Meadii* text: "This *Colias* bears close resemblance to *Hecla*, but may be readily distinguished by the glandular spot before spoken of (see Plate), a character not found in *Hecla*, and so decisive that it is not necessary to point out minor points of difference." At this late day Mr. Edwards seems to find but one item of difference between the two species, — the "glandular spot" — and it is as evident an embarrassment to him at present as it was convenient formerly. Probably it is not unfair to say that *Meadii* when named was concluded distinct from *Hecla* simply on account of two circumstances: one being the presence of the "glandular spot," the other the fact that the original catch of *Meadii* consisted of specimens colored a redder orange than *Hecla* ordinarily displays. Mr. Edwards is open to criticism in both his earlier and later attitudes in regard to *Meadii*. Considering *Meadii* distinct from *Hecla* because the original material of *Meadii* was of a redder orange than that customary in *Hecla* was the initial error. The acceptance of this color fact as a proof of distinctness was incorrect in two ways: first, because dependent on the violent assumption that all other *Meadii* would prove of as red an orange

as those first under view, — an assumption contrary to analogy; second, as involving the assumption that a degree of redness is a definitive character. Color difference, particularly a mere difference in degree of the same color, though a valuable descriptive character, is in *Colias* far from definitive or demonstrative. It is a character which itself requires examination before it can serve as an interpreter. Used blindly it may divide one species as readily as it separates two. After discovery of the fact that two species present, as to ground color, a difference which although not universal is general and consistent, this color difference becomes a valid descriptive character in contrasting the two as species, but it cannot be used definitively. Nor is it necessarily effective in assorting individuals. Individuals usually do not represent the species as to every detail of the species' character. It is indeed probably true that an individual need not represent in obvious degree any element or quality peculiar to the species. Its participation in the species' character may be limited to biological identity. But as previously suggested, for all the significant characters to lapse in one individual must be an extremely rare incident. Latterly, Mr. Edwards has lost confidence in *Meadii*. Having in the first instance adopted it as a good species partly on the merits of a considerable catch of well-behaved examples conspicuously redder than *Hecla*, he lately inclines to consider *Meadii* identical with *Hecla*

because some few admittedly exceptional examples have been found which are *not* of a redder orange than that *Hecla* wears in its northern summer resorts. The later opinion rests upon an assumption as untenable as that involved in the earlier view. If *Meadii* and *Hecla* could be shown to be absolutely lacking in color-difference as species, — that is to say, if in like conditions like color effects invariably resulted, — it would not prove the two identical, but would merely show the stated color effect to be without value as a means of distinguishing the two species. As an undeniable matter of fact, the ground color in the species *Meadii* is not the same as in the species *Hecla*, but the difference occurs as a general chromatic average, applying to *Meadii* as a species, under usual conditions, and not necessarily effective in individuals subjected to exceptional environments. If all *Meadii* were *Hecla*-colored, or if all *Heclas* were of the degree of redness customary in *Meadii*, the loss of the chromatic contrast would render the two species less readily distinguishable. But the permanent elements of figure-pattern, which have resulted from the long continued biological estrangement of the two species, and which are reliable evidences of the species' diversity, are efficient not only to define but also to distinguish the two species. The scientific comparison between *Meadii* and *Hecla* as to color does not consist in bringing two or three exceptionally pale *Meadii* into direct contrast with a

lot of *Hecla*; and it is not a legitimate conclusion that because one or two *Meadii* in a hundred are of about the same shade of orange usual in *Hecla*, therefore *Meadii* and *Hecla* constitute one species. Comparing *Meadii* as a species with *Hecla* as a species we find, as might be expected, the color difference not a definite character. But we also find that the two species show very different averages as to color, and that it is descriptively accurate to call *Meadii* a red-orange species, and *Hecla* a pale-orange species. That one is in general a red species, and the other a paler species, is no proof that they are distinct. Equally, the fact that some *Meadii* are not so red as others does not prove that all *Meadii* are *Hecla*, nor even that some *Meadii* are *Hecla*.

In *Meadii* male the basal patch of erected and densely crowded scales near costa above secondary wing,—the “gland,” the “mealy spot,” etc.—is well developed. It is moderately variable in shape and size. In color it varies from pallid yellow (nearly white) to orange, and is often partially tinged with red. *Hecla* lacks this peculiar cluster of metamorphosed scales, and its absence proves a difficult fact alike to those who incline to consider *Elis* nearer to *Hecla* than to *Meadii*, and to those who do not perceive any other distinction between *Hecla* and *Meadii*. *Elis* presents this structure about as in *Meadii*, as to form, size, and color. One *Elis* male partly approaching *Christina* in general markings has the scale-patch especially feeble, not nearly

of the usual size and definiteness: this specimen is decidedly abnormal in appearance, and it is almost the only *Colias* example I have seen with characters suggestive of hybrid origin. From correspondents I learn that of late diligent search has been made for specimens of *Hecla* male endowed with the cluster of modified scales. This is expecting too much of *Hecla*. Being the older form, and having long lived under the present restrictive conditions, it is not likely to develop progressive variations. More plausible would be a search for occasional retrogressive variations in *Meadii* or *Elis* affecting this structure. Premising the descent of *Meadii* from the earlier stock resembling *Hecla*, we may infer that the initial development of this peculiar scale structure occurred as an early incident in the differentiation of the new species. Should an occasional *Meadii* or *Elis* occur lacking this structure such finds would be of great interest as indicating the present degree of mobility of the species' character. But occurrences like those would not be of the slightest force as proving *Hecla* and *Meadii* identical. Quite the reverse, for the extreme infrequency of the exceptions would emphasize the relative universality of the normal tendency. No examples of *Elis* or *Meadii* males lacking this structure have as yet been detected. *Meadii*, being exceedingly stable in its averages, is probably no longer subject to so decisive a reversion. Should a reversionary *Meadii* be found with this

character lacking, we may most reasonably interpret the incident on its merits, and not in the manner of the people who seek after a sign. The occurrence will simply be an extremely unusual fact, contrasting with an almost universal occurrence of the directly contrary fact.

Colias has few species for so dominant a genus, a wide range of variation being retained within the limits of a species. Consequently, species which are closely allied contrast very unequally in dissimilar comparisons, a great or a small contrast resulting according as typical or approximate specimens are compared. Hence it is, the species differ somewhat vaguely, so that superficial students are easily convinced that we have far too many species of *Colias*. The general unity of pattern-method throughout the genus, combined with the wide species-content as to variation, causes a profuse diversity within the species, accompanied sometimes by an almost bewildering resemblance between one species and another. Even species not adjoining may show an approximation sufficient to render difficult an estimate of their degree of alliance. In the case under consideration this applies. It appears to me somewhat probable that the approximation between *Hecla* and *Meadii* may be merely an extreme instance of what for want of a better term I will call diffusive resemblance, and not in reality a result of contiguous alliance. Until the larva of *Hecla* is known we cannot be quite certain of the degree

of relationship existing between *Hecla* and its two Rocky Mountain allies. It is easily known to be a different species from the other two. The view that the three species are directly related, although highly plausible on geographical grounds, is preliminary rather than final. It is not especially improbable that the closer alliance of *Hecla* is with *Chrysothome* and *Thisoa*. The larva of *Elis* is greatly similar to that of the untypical form of *Colias nastes* which occurs in the Bow Valley above timber. The distinction between them is that *Nastes* is smaller, darker, and apparently far more primitive than *Elis*. The imagos indicate still more plainly the linear gap between the two species. The larva of *Hecla* is a desideratum, to assist in determining whether that species is more closely allied to *Chrysothome* or is one of the intermediate terms between the early stock of *Nastes* and the modern forms *Meadii* and *Elis*.

In Proceedings of the Acad. of Nat. Sciences of Philadelphia, page 156, 1892, Dr. Skinner describes "*Colias hecla pallida* N. var. ♀," from a single instance, and a figure of this example is published in Entomological News, Vol. 3, plate 2. Both the description and the figure suggest *Nastes* rather than *Hecla*. The figure indeed admirably represents the form of *Nastes* female which is found on the mountains about Laggan, larger than the Labrador type, and nearer to the form *Werdandi* of northern Europe. I make this note hoping it

may cause Dr. Skinner to compare his example with *Nastes* of the Rocky Mts. *Nastes* at Laggan is an exceedingly variable species, and the published figure of *Pallida* inclines me to think the original may be a somewhat untypical ♀ *Nastes*, instead of a *Hecla*. Analogy in *Meadii* and *Elis* does not favor the probability of a white ♀ in *Hecla*.

Since my earlier account of *Colias Elis*, in the Canadian Entomologist, July 1890, little further knowledge of its geographical distribution has been obtained. Mr. H. H. Lyman found one ♀ at Banff, 36 miles east of Laggan, in 1890, and Mr. H. K. Burrison collected several specimens there in the same season. I am not aware of any other observations outside the original district extending from Laggan to Hector. *Meadii*, as distinct from *Elis*, does not occur at Laggan, and there is no separation of *Elis* into two forms, one of them more closely approaching *Meadii*. The publication of *Meadii* by Capt. Geddes as occurring in Kicking Horse Pass is probably to be understood as cancelled by his later announcement of *Elis* from the same locality. Up to the present time *Meadii* seems not to have been found north of the international boundary, and *Hecla* has, I think, not yet been reported from points nearer this district than Hudson's Bay and Alaska. *Elis* thus retains its vague geographical isolation.

I am now able to speak definitely in regard to the supposed "albino ♀" of

Elis. Mr. Strecker's determination proves to have been based upon several ♀ examples of a Laggan butterfly closely allied to *Pelidne*, which I have in correspondence designated by the MS. name *Colias minisni*,—of which perhaps further hereafter. Having sent Mr. Strecker fine examples of this pale female *Colias*, and also of its appropriate male, he distinctly recognizes the ♀ as the original of his *Elis* albino ♀, and the latter determination is to be considered recalled.

My series of *Elis* now represents the result of eight seasons' collecting. During that time every specimen collected has been critically examined, and every example requisite for an understanding of the species has been embodied in my collection. The representation is now so complete that probably no element of the variation is lacking, and the species stands confessed in all its multiform simplicity. I find that in proportion as the material becomes more fully representative so the individuality of *Elis* as a distinct species grows, with the effect that occasional instances partly shading toward *Meadii* have become at length more evidently absorbed into *Elis* by the presence of intermediate steps of variation which unite the extremes with the more typical elements of the species. Complete material supplies a fuller presentation of the consecutive variation, and results in a more accurate identification and explanation of the imperfectly typical examples. This

perfected series of *Elis* does not appear to bring the species as a whole nearer to *Meadii*, but has rather a contrary effect. While it renders increasingly plain the fact that the neutral ground between *Meadii* and *Elis* is but narrow, measured for instance by the relative unlikeness of any two closely approximate males in the two species, yet it makes more appreciable than before the systematic alienation, and the consequent diversity of averages, distinguishing the two closely allied kinds. Species so closely related as these cannot be satisfactorily estimated from scrutiny of a few isolated examples. In critical cases, before a doubtful specimen can aid in a final determination of the limits and position of the species, the dubious

example must itself be identified by comparison with the species. If two males of *Elis*, one highly typical and one extremely divergent in the conservative direction, are brought into contrast with the adjacent species *Meadii*, the very obvious hiatus between the two *Elis* (resulting from absence of perhaps a dozen usual intergrades) may impress an observer as a far more momentous separation than the narrow interval parting the off-type individual of *Elis* from the species *Meadii*. But when the missing intergrades are procured, and the vacuum (which Nature abhors) is filled, the resemblance of the untypical example to *Meadii* at once takes secondary place, and its affinity for the species *Elis* becomes the prominent fact.

WESTERN PEDICIAE, BITTACOMORPHAE AND TRICHOCERAE.

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The perusal of J. M. Aldrich's paper in *Psyche*, February 1895, aroused my recollections of twenty years ago, and made me examine old manuscript notes of mine. What I found in them may be of some use in connection with the three above-named genera.

Pedicia obtusa. Since I described this species in 1877, I have received from Mr. James Behrens of San Francisco a pair of it, taken in Siskiyou Co., Cal., on Sept. 27 and Oct. 6. Both specimens agree with the one

described by me in *not* having the brown pattern of the wings prolonged towards the posterior margin. The female has the usual double stripe in the middle of the thorax of a saturate yellow, longitudinally bisected by a brown line, which is the prolongation of the narrow median black line of the pronotum (or collar), and reaches backwards the tip of the scutellum. The male is a somewhat immature specimen, paler yellow in coloring; the thoracic brown line is perceptible